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National Center for Research Resources

Scientific Planning Forum 1997

Choices and Challenges: Future Directions for NCRR

September 10-11, 1997

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Opening Plenary Session

Judith L. Vaitukaitis, M.D.

Director of NCRR

At the opening of NCRR's two-day Scientific Planning Forum 1997, "Choices and Challenges: Future Directions for NCRR," NCRR Director Dr. Judith L. Vaitukaitis addressed a plenary session of participants. At the last scientific planning forum, she noted, the following guiding principles were chosen to help NCRR set priorities when making difficult choices for its portfolio of support. NCRR resources and technologies are:

- At the cutting edge of innovation in technologies and research, including high-risk research that may have high payoff.
- Often one-of-a-kind, scarce, or expensive.
- Accessible and responsive to the research needs of the biomedical research community.
- Cost-saving, efficient, and shared.
- Multidisciplinary and collaborative, often serving to integrate diverse research efforts.
- Stable and flexible, allowing scientists to react rapidly and effectively to emerging research needs and unexpected opportunities.

She asked that participants help NCRR update its 1993 plan by identifying current trends in biomedical research, identifying the critical resources and technologies that can address those trends, and finally, identifying strategies or opportunities that will help NCRR catalyze needed research and technologies.

Dr. Vaitukaitis noted that about 90 percent of the recommendations in the 1993 plan have already been implemented. Hopefully, she said, the new plan will last even longer.

Louis W. Sullivan, M.D.

Forum Co-Moderator

President, Morehouse School of Medicine

Dr. Sullivan described some of the biomedical advances that have helped to improve human health, but he also noted that scientists must do a better job of communicating the importance of their research to the public. He sees a clear need for conducting strategic reviews such as NCRR's scientific planning forum, in which scientists themselves help chart their own future. Input from forum participants will help NCRR to focus in new directions and fine-tune directions already taken.

Science cannot be highly programmed, Dr. Sullivan noted. The system must allow for exploitation of unanticipated observations. In addition, opportunities must be created for young people to enter scientific fields, as their contributions to the process of self-renewal are critical to the scientific enterprise. The peer-review process also plays an essential role in maintaining the vitality of science. Finally, all segments of our society must be encouraged to participate in the scientific enterprise. This will ensure that the best ideas and the best minds are brought to bear on important questions and problems that affect human health.

Joshua Lederberg, Ph.D.

Forum Co-Moderator

President Emeritus, Rockefeller University

Dr. Lederberg described some trends that have emerged since NCRR's first planning document was developed. Some of these trends are internal to the scientific enterprise, and costly technologies may be needed to exploit these new discoveries. In addition, ingenious techniques such as the polymerase chain reaction have been developed and come into wide use. Finally, there is a continual need for increasing the speed and power of new technologies, which also requires an increase in capital investments.

At a plenary discussion following Work Session I, Dr. Lederberg asked participants to consider broad opportunities for strategic choices, rather than focusing on particulars. He suggested that the possibilities be thought of as an N-dimensional space containing orthogonal vectors, each of which represents broad categories such as the following:

- Social needs, demands, and restraints: burden of disease, ethics, patents
- Available and prospective technologies and instruments: spectrometers, imagers, computers
- Level of complexity: atom, molecule, cell, organ, organism, patients, populations. Specific organ systems: brain, immune system
- Target species: phylogenetic system: microbes, mice, men
- Gene expression, transgenics: DNA Process model. Information flow from DNA to RNA to protein to proteome. Also from genome to phenome
- Developmental cycle: from the fertilized egg to embryo to adult to senescence.

The above categories, or dimensions, crosscut one another and are not mutually exclusive. During Work Group discussions, Dr. Lederberg suggested, participants might consider whether their proposals contain an appropriate array of alternatives within this N-dimensional universe. The group might discuss whether they've developed an exhaustive list and ask if there are other vectors that should be considered. Once broad categories have been sized up, the group may recognize specific choices within each vector: for technological opportunities, social needs, scientific interests, or scientific opportunities.